

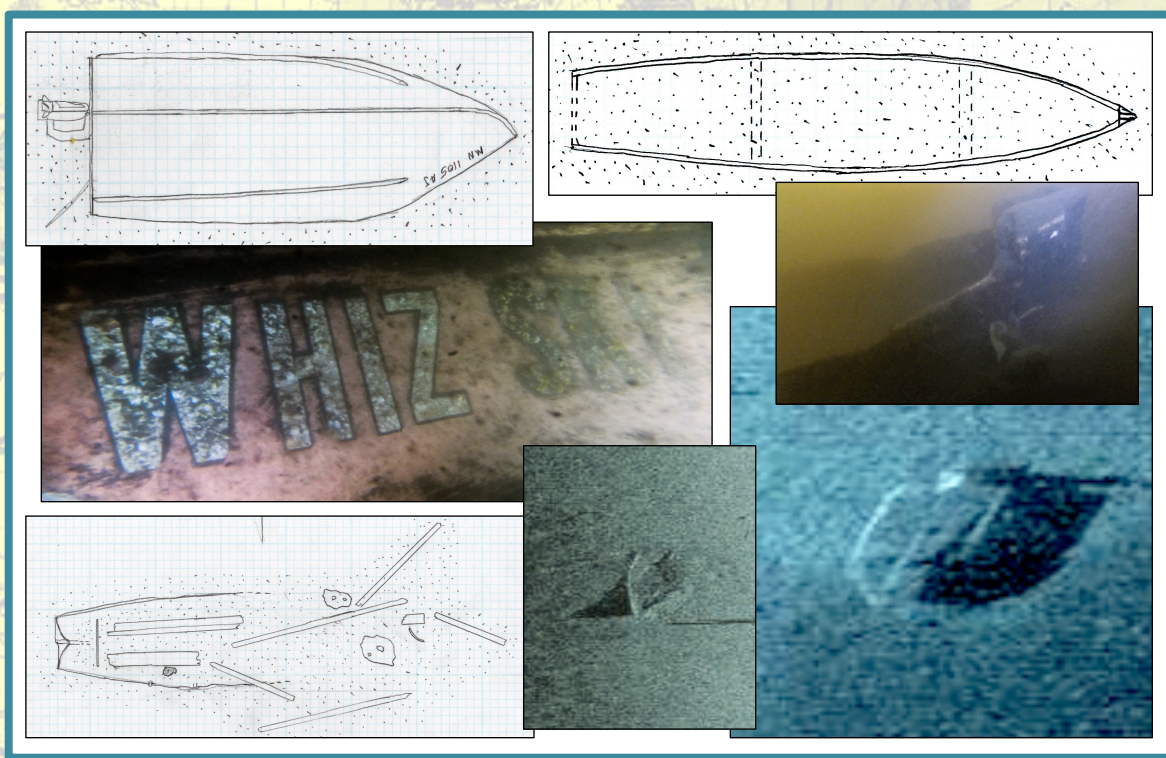


Ann Merriman
Christopher Olson
Minnesota Archaeological License 22-075



Minnesota Suburban Lakes Projects Series
Southern and West Metro Lakes Underwater Archaeology Project

Crystal Lake Underwater Archaeology Project Report



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Ann Merriman, Christopher Olson, and Maritime Heritage Minnesota

Acknowledgments

Maritime Heritage Minnesota (MHM) thanks the People of Minnesota for their support of the Minnesota Historical and Cultural Heritage Grant program, part of the Clean Water, Land and Legacy Amendment; MHM received a MHCH Grant to conduct this work. The Minnesota Suburban Lakes Projects could not have been completed without the support and skill of MHM volunteers Kelly Nehowig and Josh Knutson. Along with MHM, Kelly and Josh produced the underwater video for this project. MHM thanks DNR Officers Kong Moua and John Nordby for their time and expertise. This project could not have been completed in a timely fashion without the consideration of MHM's Chair and Commodore Michael F. Kramer for the on-land storage of MHM's boat. Lastly, MHM thanks our Board of Trustees Mike, Deb Handschin, and Steve Hack for their continued support.

Maritime Heritage Minnesota



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MHM IS A 501.(c).3 NON-PROFIT CORPORATION DEDICATED TO THE DOCUMENTATION, CONSERVATION, AND PRESERVATION OF MINNESOTA'S FINITE MARITIME CULTURAL RESOURCES

“...grants have allowed a small St. Paul-based nonprofit, Maritime Heritage Minnesota (MHM), to re-establish the discipline of underwater archaeology in Minnesota. Without this support, MHM could not have conducted its groundbreaking nautical archeological and maritime historical research.”

~Steve Elliott, Former Minnesota Historical Society CEO and Director, January 2015

Introduction

Wrecks and the artifacts associated with them tell a story. Removing or otherwise disturbing artifacts, treating them as commodities that can be sold, obliterates that story. Nautical archaeological and maritime sites are finite, and are significant submerged cultural resources. Nautical, maritime, underwater, maritime terrestrial – Maritime Heritage Minnesota's (MHM) deals with all of these types of sites throughout the State of Minnesota. MHM's Mission is to document, conserve, preserve, and when necessary, excavate these finite cultural resources where the welfare of the artifact is paramount. MHM is concerned with protecting our underwater and maritime sites – our shared Maritime History – for their own benefit in order for all Minnesotans to gain the knowledge that can be obtained through their study. MHM's study of wrecks does not include the removal of artifacts or damaging the sites in any way. MHM does not raise wrecks or 'hunt' for 'treasure'. Submerged archaeological sites in Minnesota are subject to the same State statutes as terrestrial sites: the Minnesota Field Archaeology Act (1963), Minnesota Historic Sites Act (1965), the Minnesota Historic District Act (1971), and the Minnesota Private Cemeteries Act (1976) if human remains are associated with a submerged site. Further, the case of *State v. Bollenbach* (1954) and the Federal Abandoned Shipwrecks Act of 1987 provide additional jurisdictional considerations when determining State oversight and "ownership" of resources defined by law as archaeological sites (Marken, Ollendorf, Nunnally, and Anfinson 1997, 3-4). Therefore, just like terrestrial archaeologists working for the State or with contract firms, underwater archaeologists are required to have the necessary education, appropriate credentials, and hold valid licenses from the Office of the State Archaeologist (OSA).

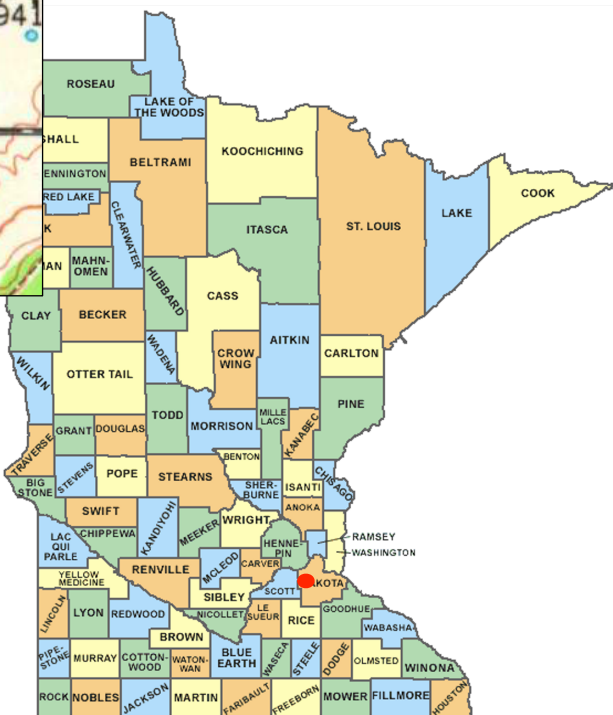
Research Design and Methodology

This project is a significant step toward the comprehensive identification, documentation, preservation, and conservation of submerged cultural resources in Minnesota. The Crystal Lake Underwater Archaeology Project (CLUA) in Dakota County is part of the Southern and West Metro Lakes Underwater Archaeology Project (SWMLUA) that falls under the umbrella program, the Minnesota Suburban Lakes Survey Projects (MSLS). Lake Minnewashta and Lotus Lake in Carver County and Scott County's Prior Lake were also investigated during the SWMLUA Project. The purpose of the CLUA Project as part of the SWMLUA Project is to increase the collective maritime archaeological and historical knowledge of Minnesotans through the analysis of anomalies recorded on the bottoms of our state's suburban lakes during side and down-imaging sonar surveys. The CLUA Project is a Phase 1 underwater archaeological diving reconnaissance survey designed to locate, identify, and rudimentarily document objects - wrecks and other sites - on the lake bottom.

Prior to the beginning of the SWMLUA Project, MHM located and identified watercraft wrecks on the bottom of smaller Minnesota suburban lakes including nearby Prior Lake, Christmas Lake, Medicine Lake, Lake Johanna, and Forest Lake. MHM has also identified and documented wrecks in larger lakes including Lake Minnetonka, White Bear Lake, and Lake Waconia. MHM recognized 31 anomalies on the lake bottom during the remote sensing survey of Crystal Lake in 2020. During the 2022 fieldwork season, MHM and its volunteers dove on 6 anomalies in the lake, but only located 5 of them due to low visibility. MHM conducted the diving reconnaissance in Crystal Lake during 3 days of fieldwork; 2 days in late June and another in mid-August. MHM used its research boat, *Anomaly 51*, to pinpoint the dive locations using embedded GPS data collected during sonar recording review, and a weighted Diver Down Buoy was deployed at the proper coordinates. MHM's Underwater Archaeologists and Volunteers then descended to the lake bottom to locate and document the anomalies. Using data accumulated from the fieldwork as a starting point, MHM conducted research to place newly recognized nautical archaeological sites and anomalies into their historical contexts. Minnesota Archaeological Site Forms were filed with the Office of the State Archaeologist (OSA) when appropriate.



A map of Crystal Lake
(USGS 1957)



The red circle marks the location
of Crystal Lake in Burnsville in
Dakota County

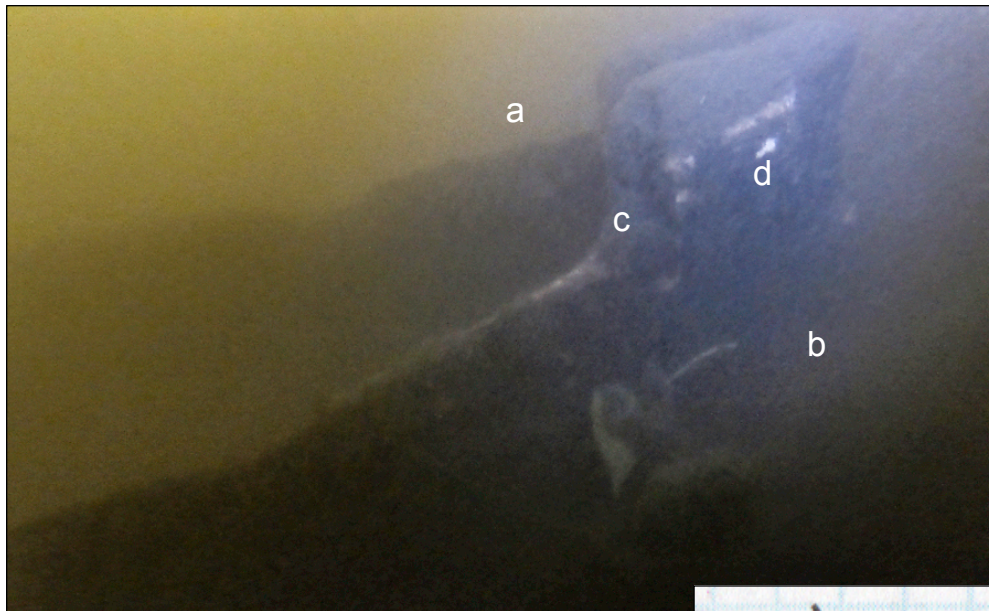
Results: Crystal Lake Underwater Archaeological Reconnaissance

After the completion of the CLUA/SWMLUA Project fieldwork in Crystal Lake in August 2022, there are now 4 identified wrecks, 1 maritime site, and 1 unidentified wreck on the lake bottom. Dozens of other anomalies have not been investigated yet and their sonar signatures indicate their documentation in the future will produce promising results. The anomalies were identified through underwater archaeological reconnaissance fieldwork using SCUBA, digital video, measured drawings, side and down-imaging sonar, and maritime historical research. Of the 4 identified wrecks in Crystal Lake, 3 of them now have Minnesota Archaeological Site numbers. The 4 anomalies identified as wrecks are A1, A7, A12, and A16, the maritime site is Anomaly 25, and the unidentified wreck is Anomaly 2.

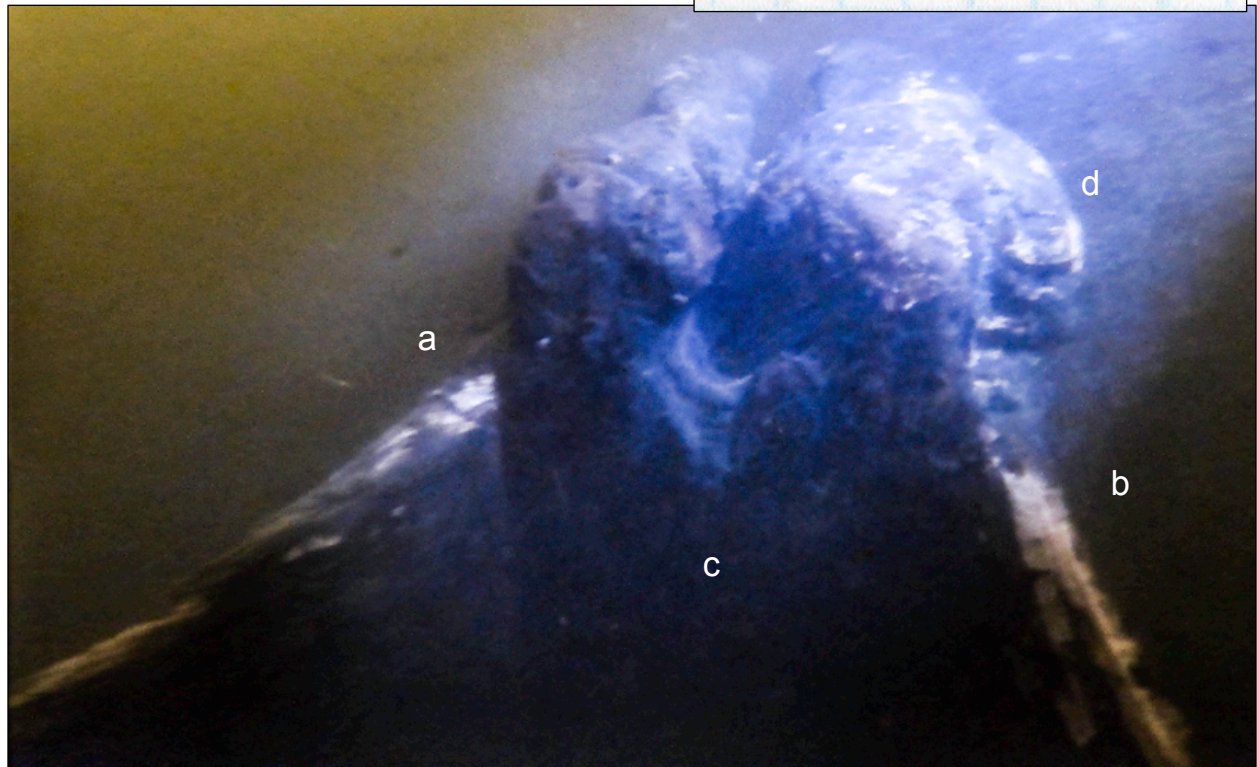
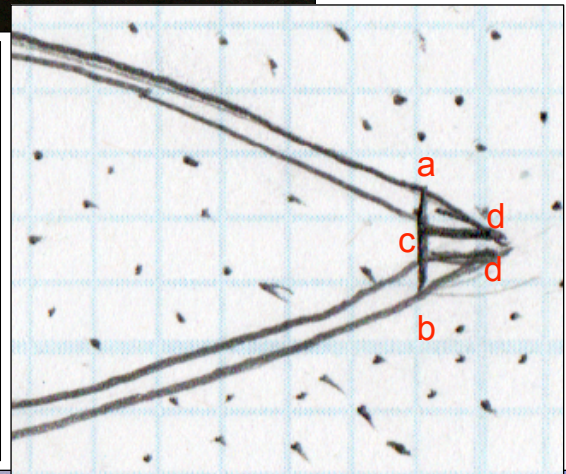
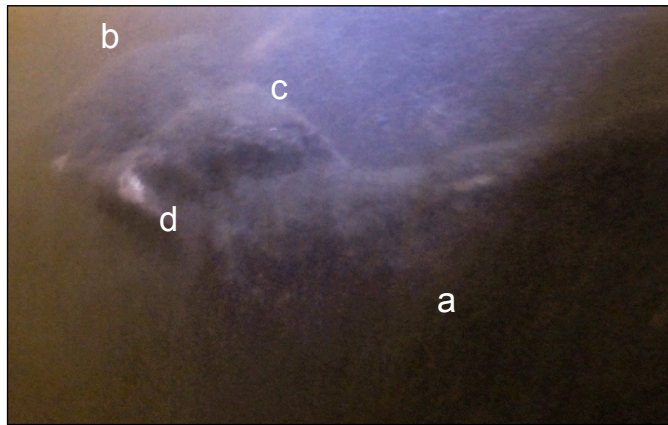
Wooden Flat-Bottomed Wreck, 21-DK-161 (Anomaly 16)

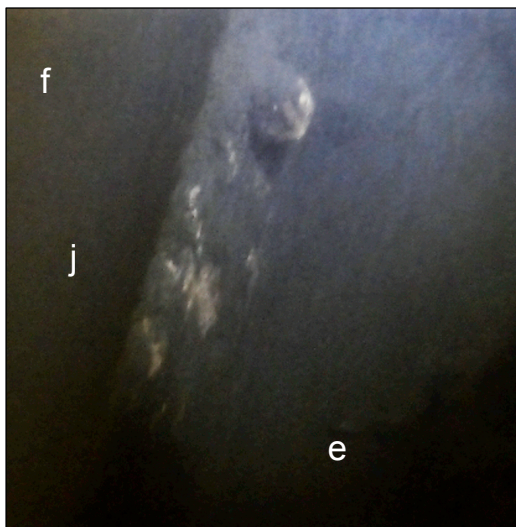
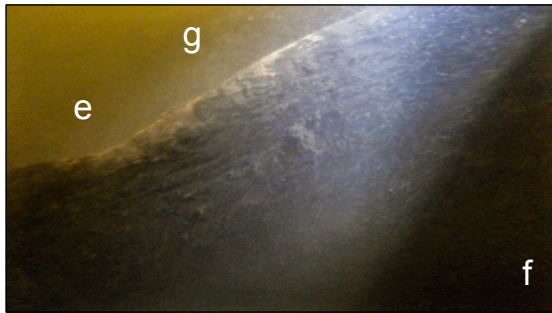
The Wooden Flat-Bottomed Wreck is 16.00 feet long, 3.30 feet in the beam, and 2.20 feet wide at the transom. The bow is pointed with a thick and sturdy stempost; both the starboard and port bow strakes rabbit into the post. The sheer - topmost - strake is mostly missing throughout the wreck, but the forward section attached to the stempost survives. The wreck's sides are comprised of a few planks and it is carvel-built (edge-to-edge planks), and through touch, 2 floors were felt on the inner hull bottom. The port quarter can be seen (the lake's visibility is very low), and it can be discerned that the wreck has a hard chine and flat bottom. The sheer strake of the square transom is missing and the rest of the stern is buried in silt; this information was collected by hand-probing. Anomaly 16 has the remnants of 2 benches fore and aft of amidships covered in silt, and it would have/may have a stern bench. Remnants of white primer or paint can be seen in different areas of the wreck. While it cannot be determined, the wreck likely is athwartships-planked, a defining attribute of the Fisherman's Friend model. The Fisherman's Friend design derives its name from the model of small wooden rowboat produced by the Ramaley Boat Company the early 1900s. MHM has identified 4 Fisherman's Friend Wrecks in Lake Minnetonka (21-HE-485, 21-HE-489, 21-HE-499, 21-HE-509) and 2 museum examples have been documented using 3D technology (West Hennepin History Center, Museum of Lake Minnetonka). Additionally, MHM has identified 8 small wooden flat-bottomed wrecks in Lake Minnetonka (21-HE-488), Christmas Lake (32-HE-543), Medicine Lake (21-HE-518), Lake Johanna (21-RA-85), Lake Pulaski (21-WR-203), Forest Lake (21-HE-123), and Prior Lake (21-SC-116 and Anomaly 84 from this project). The Wooden Flat-Bottomed Wreck was constructed around 1900 and since the average lifespan of a small wooden boat was not extremely long, a site disposition date of 1915 is reasonable. MHM submitted a Minnesota Archaeological Site Form to the OSA and Anomaly 16 received her site number - 21-DK-161 - at that time. 21-DK-161 is protected under the Federal Abandoned Shipwreck Act of 1987 and 1954 Minnesota State Law.



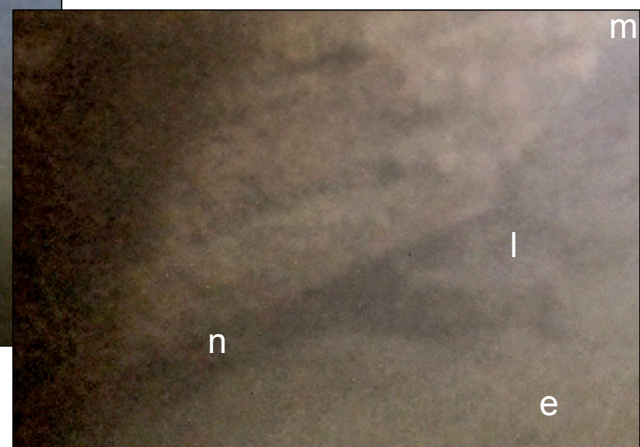
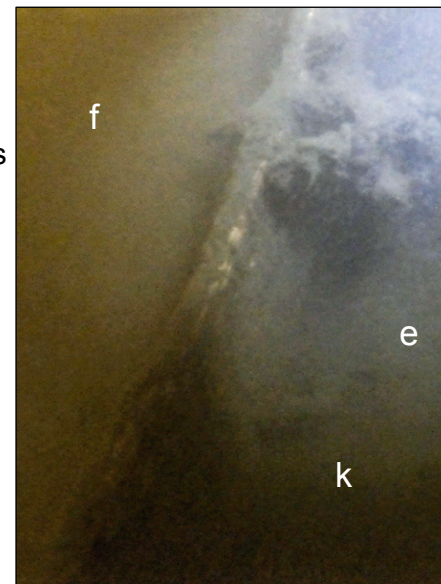
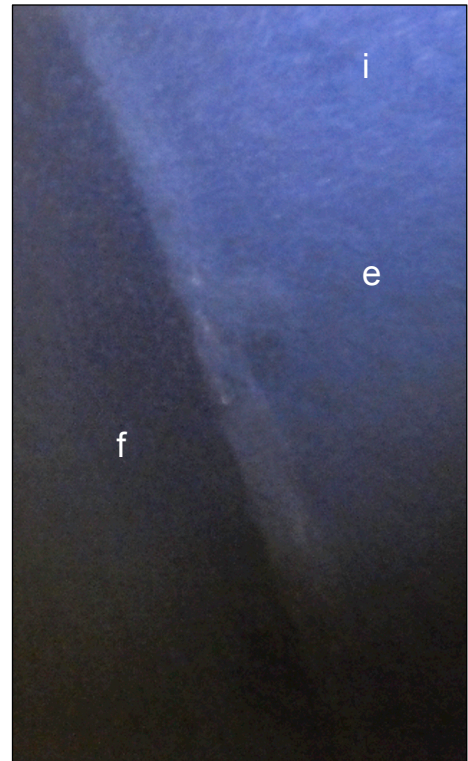


a: Port Bow
b: Starboard Bow
c: Stempost
d: Sheer Strake



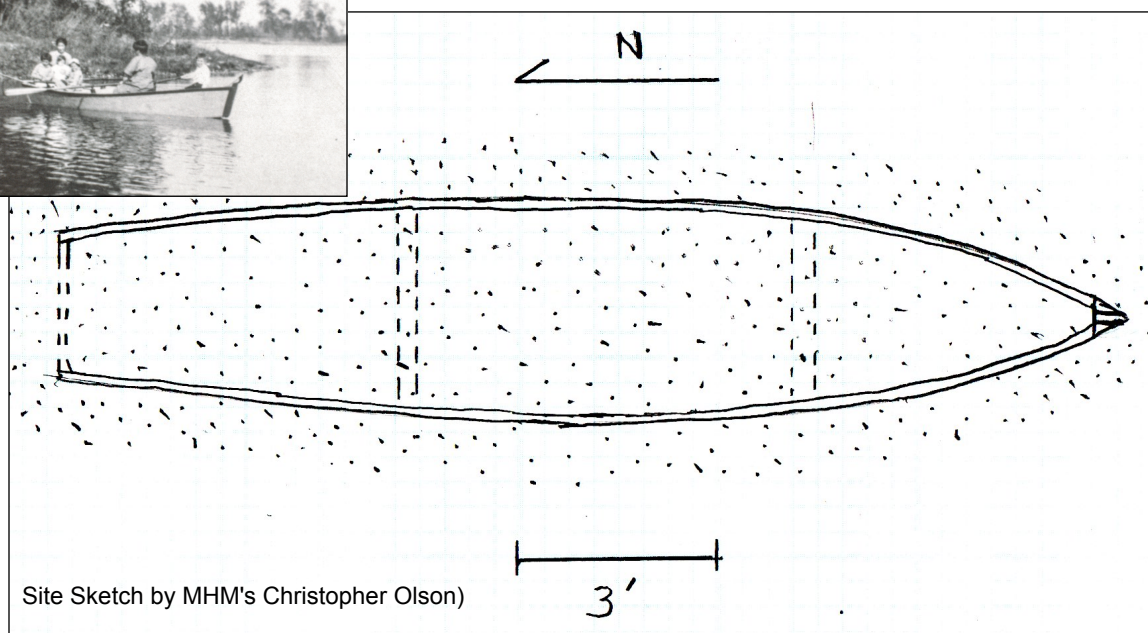


e: Outside Wreck
f: Inside Wreck
g: Port Bow
h: Port Amidships
i: Starboard Amidships
j: Port Aft
k: Starboard Aft
l: Port Quarter
m: Stern
n: Hard Chine





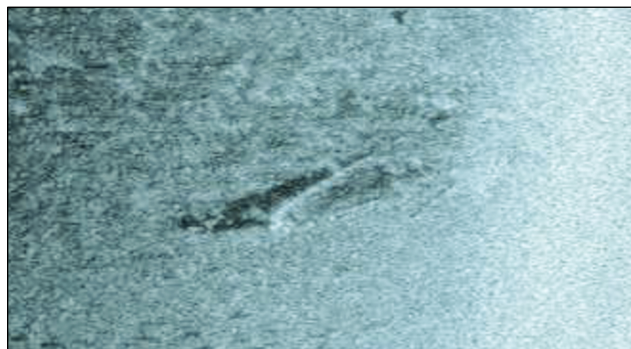
A small boat owned by Judd's Lakehouse Hotel for the use of its patrons. This boat is a flat-bottomed model, probably a Fisherman's Friend (MNHS GV3.61r36)



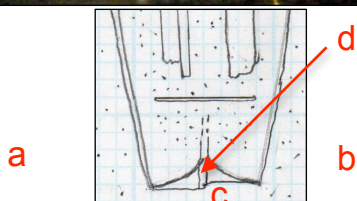
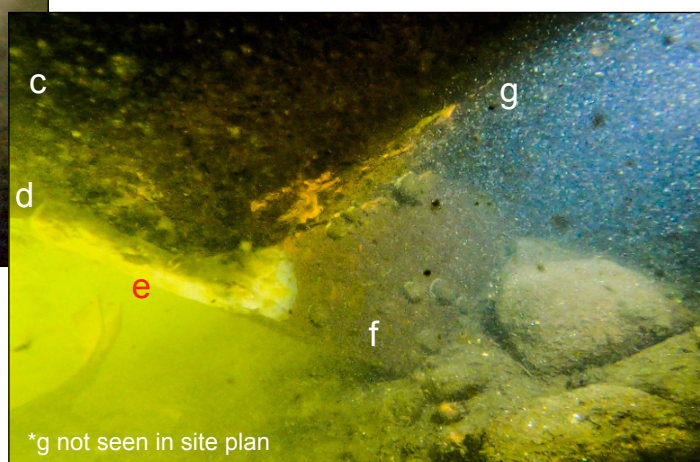
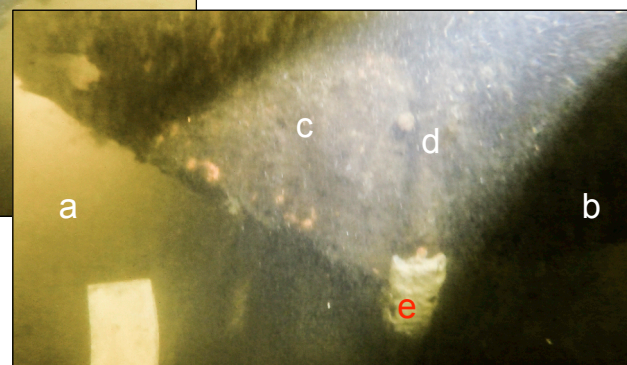
Steel Wineglass Stern Wreck, 21-DK-160 (Anomaly 7)

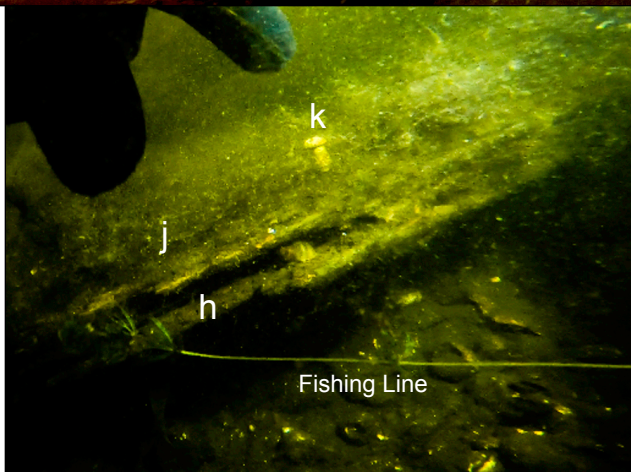
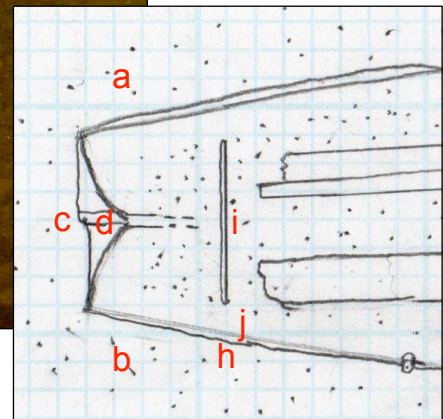
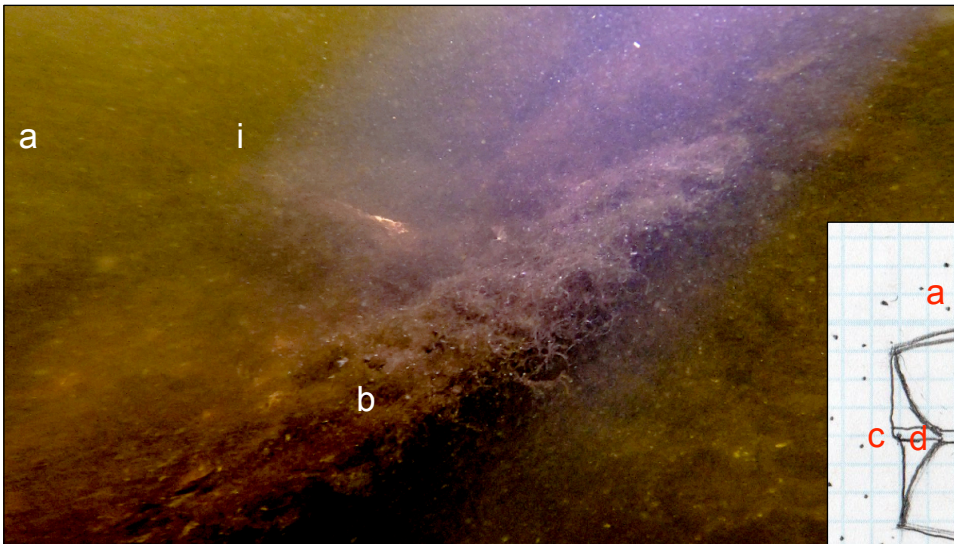
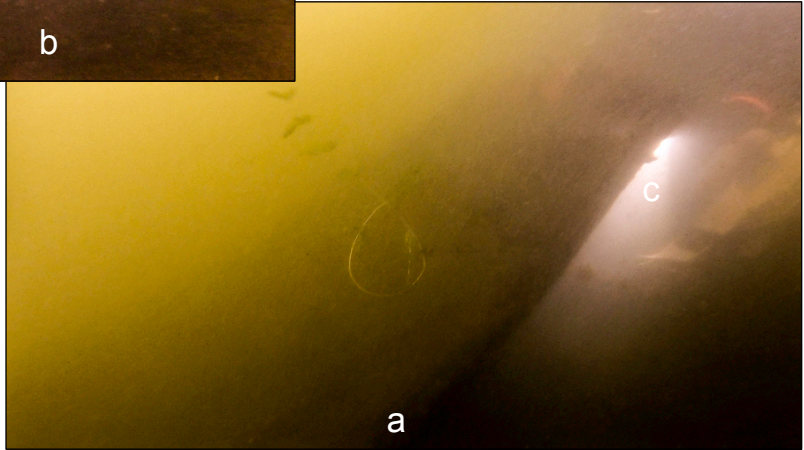
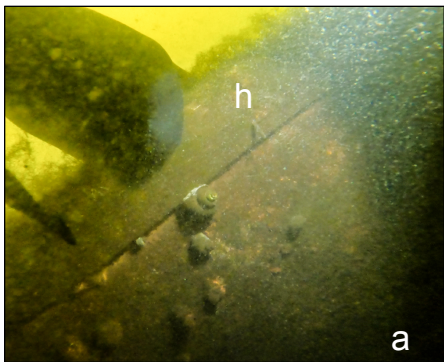
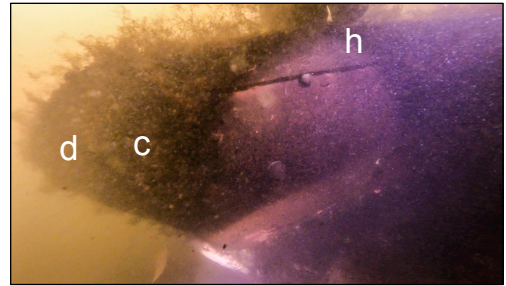
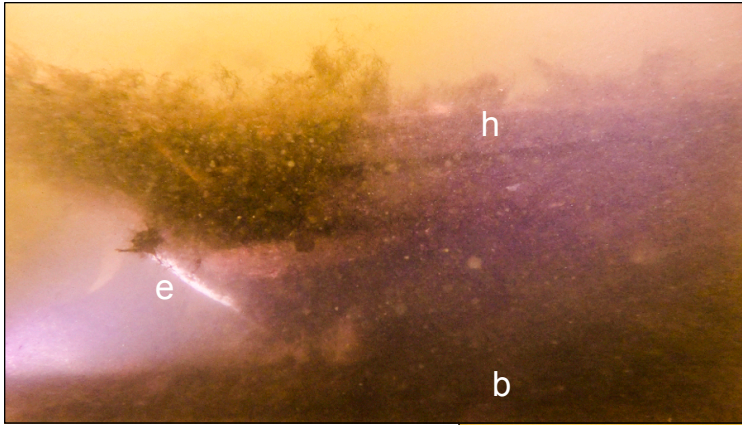
The Steel Wineglass Stern Wreck is about 13.00 feet long (the bow is partially destroyed and buried), 4.50 feet in the beam, and 2.50 feet wide at the transom. The forward section of the hull is filled with silt and buried, and partially destroyed; probing by hand into the silt located the damaged bow. The gunwale survives at the wineglass stern and the port and starboard quarters, and it nearly intact amidships, although it is lying nearly flat and splayed out. The intact gunwale areas have a wooden rubrail on the outer hull and a wooden stringer on the inner hull. Sturdy slot-head wood screws attach the wood to the steel; these screws might be brass. On the starboard quarter, a sturdy and heavy steel oarlock attached to the gunwale by a rectangular base survives - and one in-situ steel frame is evident attached to the inner hull. The wineglass stern is completely exposed and the sternpost is clearly seen. The skeg, with a thick layer of caulking on its upper end, connects with the sternpost and continues under the wreck and into the silt. It cannot be seen, but the skeg will merge with the keel that is currently covered in rocks and silt. Two hull plates of the wreck's bottom survive forward among the broken-up portion of the wreck; some loose metal frames are also laying on and around the steel pieces. Evidence of two wooden benches survive near the stern - a wooden bulwark - and loose in the silt near the port bow. An amidships bench must have existed when the wreck was floating. A few thin pieces of wood 'floor' remain in situ from amidships to the stern and several other floor pieces are loose on and off the wreck. The outer hull, what little of it survives and is visible and smooth, as opposed to some small steel boats that are faux lapstrake. MHM contends the Steel Wineglass Stern Wreck was constructed around 1910 based on the narrow design of the wineglass transom, as opposed to the wider construction that was employed up to 1900. Due to her nearly buried nature, MHM suggests Anomaly 7 sank around 1930. One of the earliest manufacturers of small steel boats was the W. H. Mullins Company of Salem,

OH; prior to 1905, Mullins primarily constructed row boats. Also, Minnesota companies produced small steel boats in the early 20th Century including Pearson's of Duluth, the Minneapolis Steel Boat Company, O'Hara Brothers Boat Company, and the Sanderson Boat and Engine Company. Anomaly 7 is only the third steel wineglass stern wreck identified in Minnesota. The other sites are 21-WA-122 in Forest Lake and 21-HE-561 in Lake Minnetonka. MHM submitted a Minnesota Archaeological Site Form to the OSA and Anomaly 7 received her site number - 21-DK-160 - at that time. 21-DK-160 is protected under the Federal Abandoned Shipwreck Act of 1987 and 1954 Minnesota State Law.



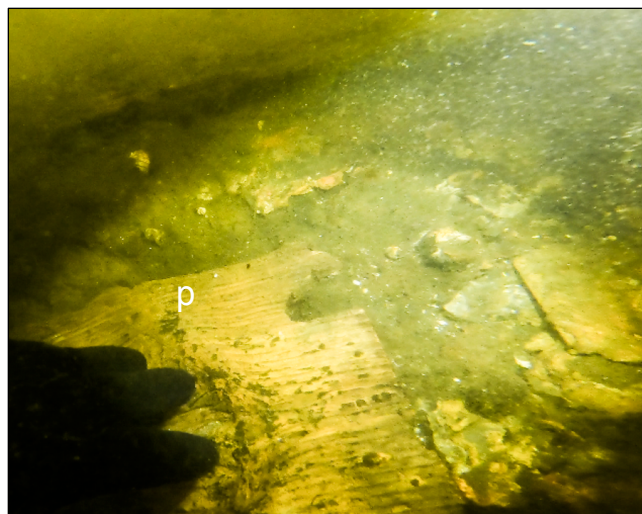
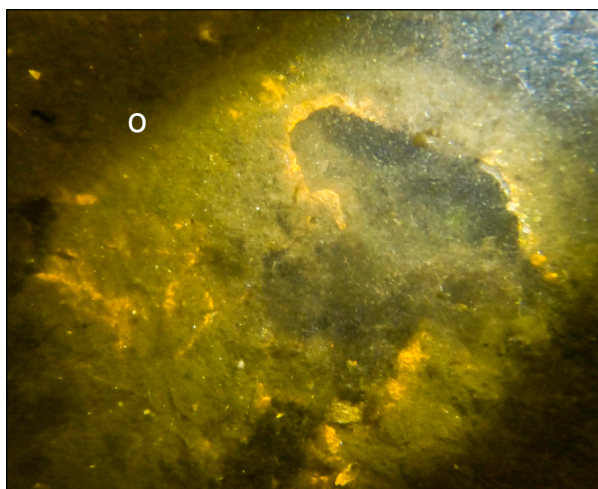
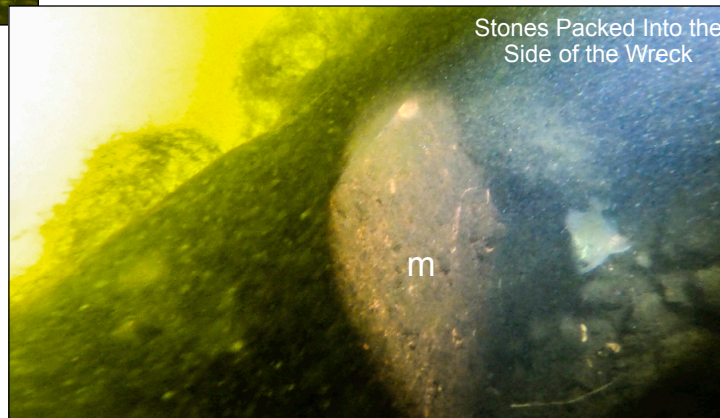
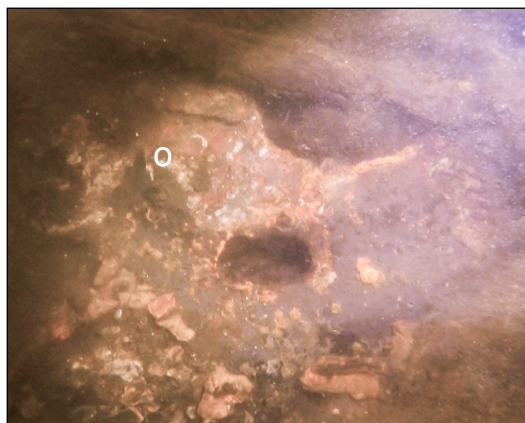
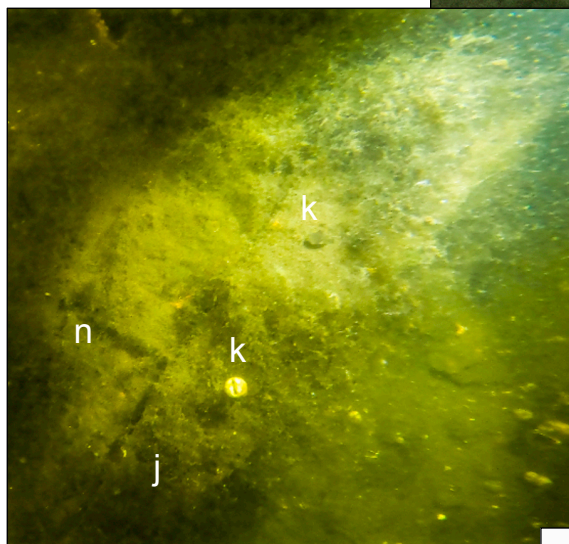
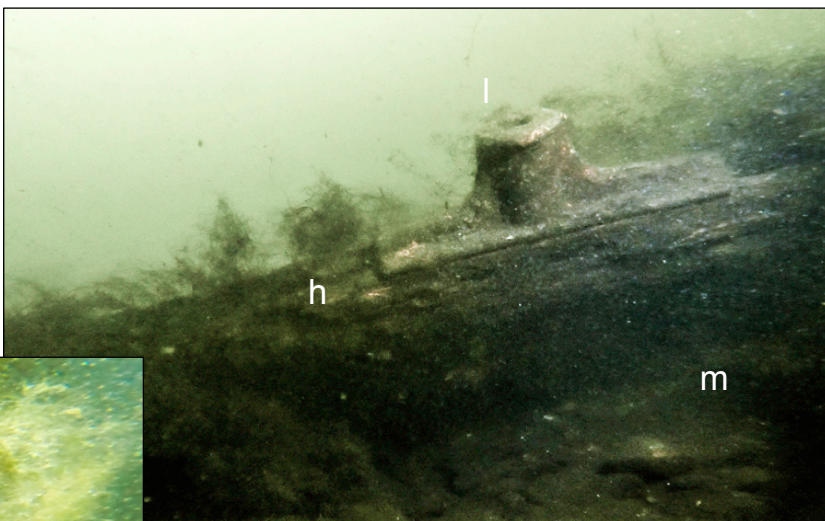
- a: Port Quarter
- b: Starboard Quarter
- c: Wineglass Stern
- d: Sternpost
- e: Skeg With Caulking
- f: Skeg
- g: Hull Bottom

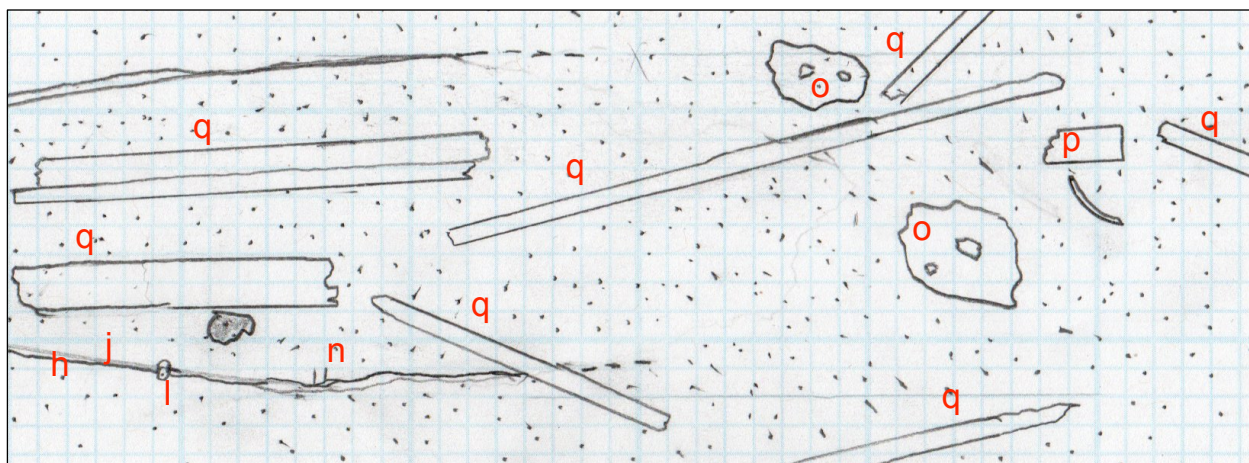




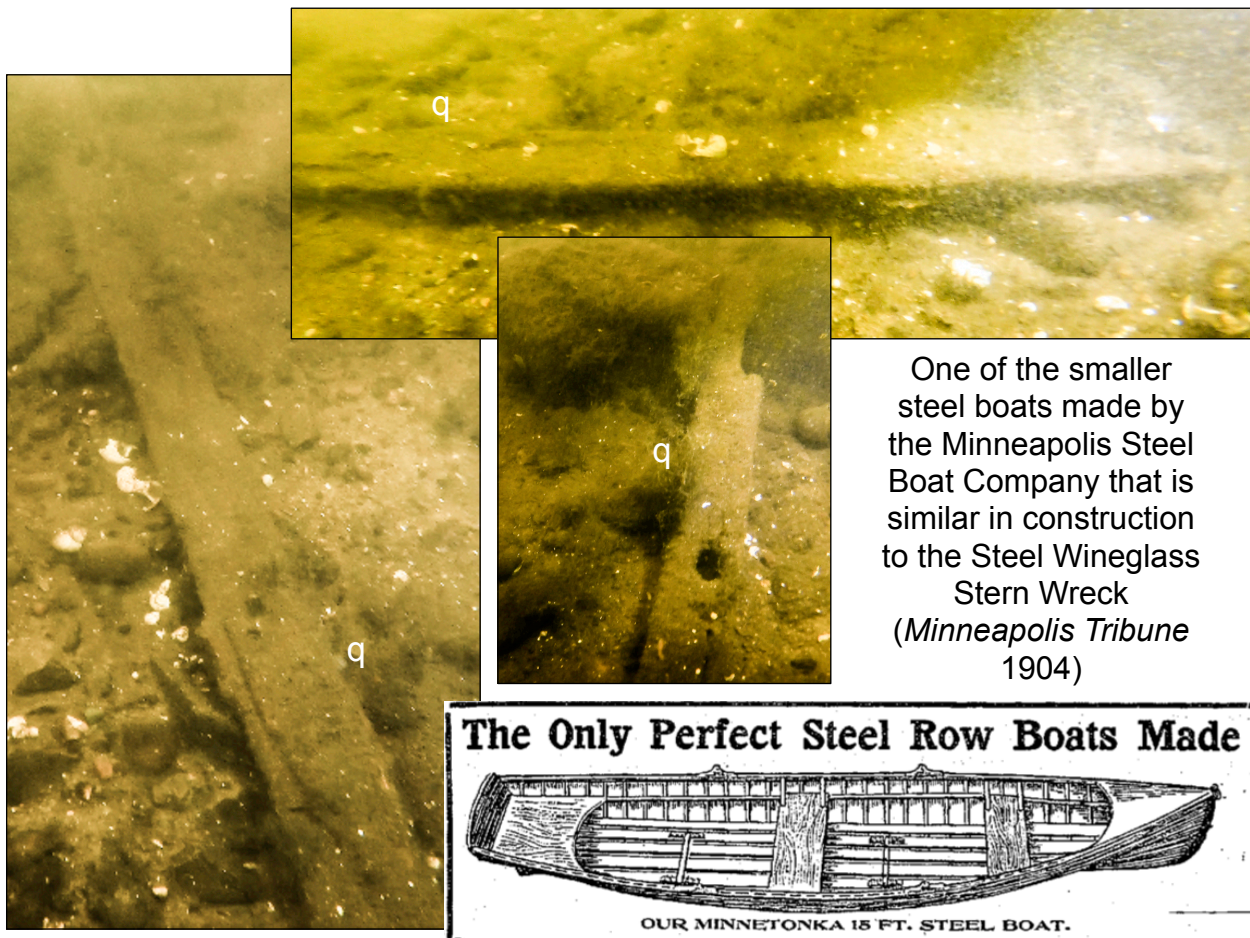
- a: Port Quarter
- b: Starboard Quarter
- c: Wineglass Stern
- d: Sternpost
- e: Skeg With Caulking
- h: Wooden Rubrail
- i: Wooden Bench Seat Bulwark
- j: Wooden Stringer
- k: Slot-Head Screw

h: Wooden Rubrail
 j: Wooden Stringer
 k: Slot-Head Screw
 l: Starboard Oarlock
 m: Starboard Hull
 n: Frame/Futtock
 o: Hull Plate
 p: Wooden Bench Piece



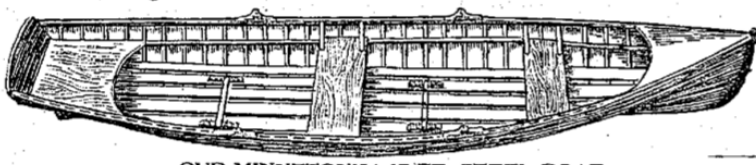


h: Wooden Rubrail
 j: Wooden Stringer
 k: Slot-Head Screw
 l: Starboard Oarlock
 m: Starboard Hull
 n: Frame/Futtock
 o: Hull Plate
 p: Wooden Bench Piece
 q: Wooden Floor Pieces*
 *Some Loose

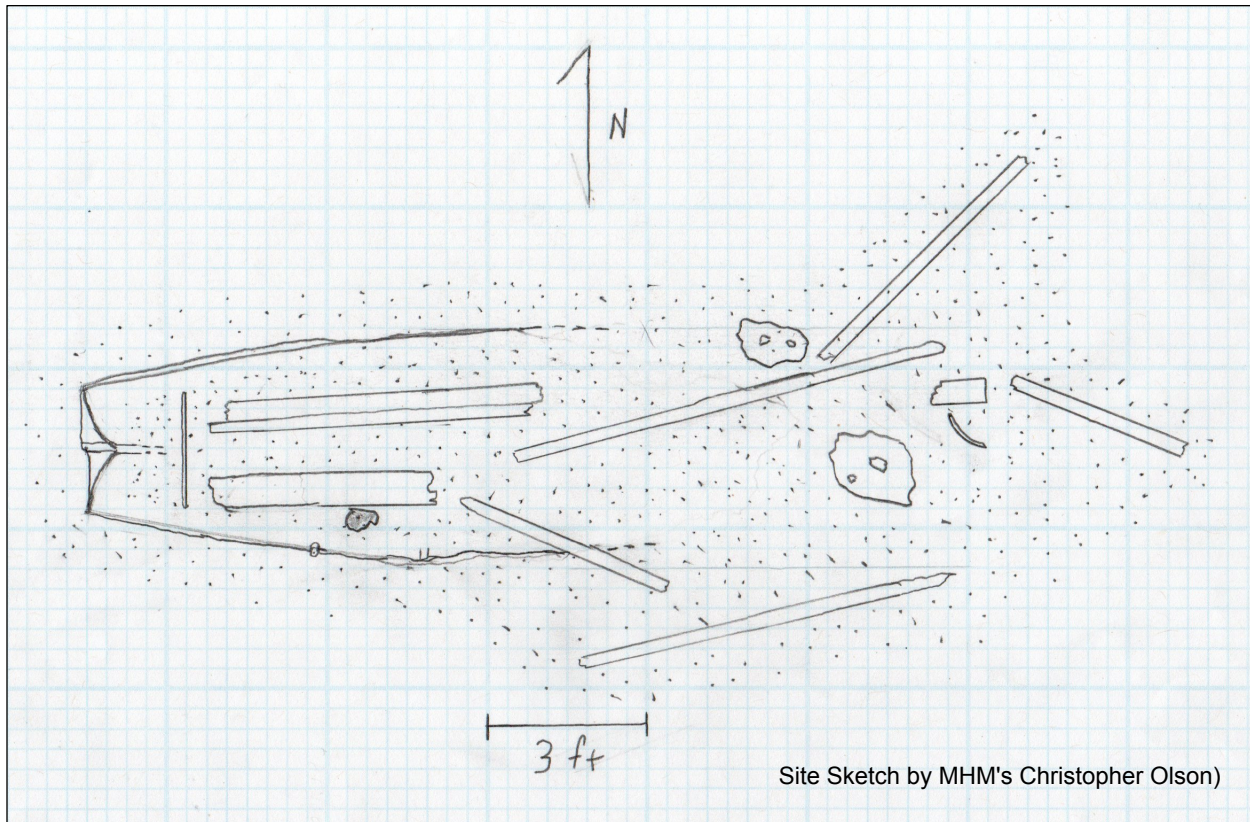


One of the smaller
 steel boats made by
 the Minneapolis Steel
 Boat Company that is
 similar in construction
 to the Steel Wineglass
 Stern Wreck
 (Minneapolis Tribune
 1904)

The Only Perfect Steel Row Boats Made



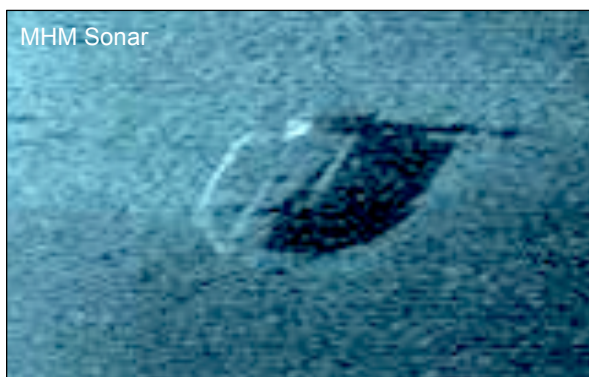
OUR MINNETONKA 15 FT. STEEL BOAT.

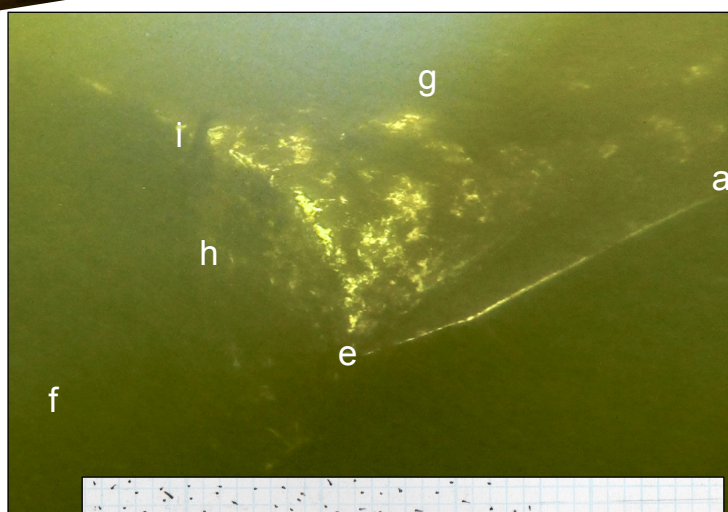
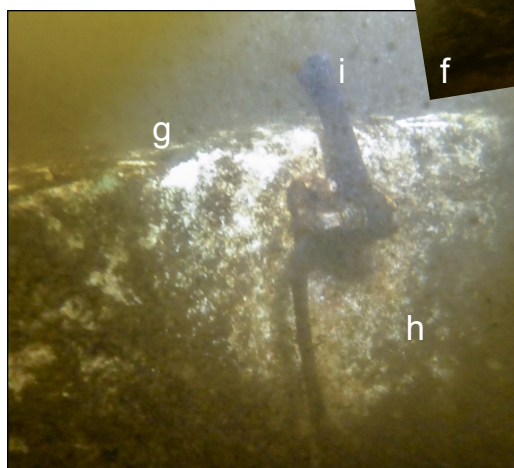
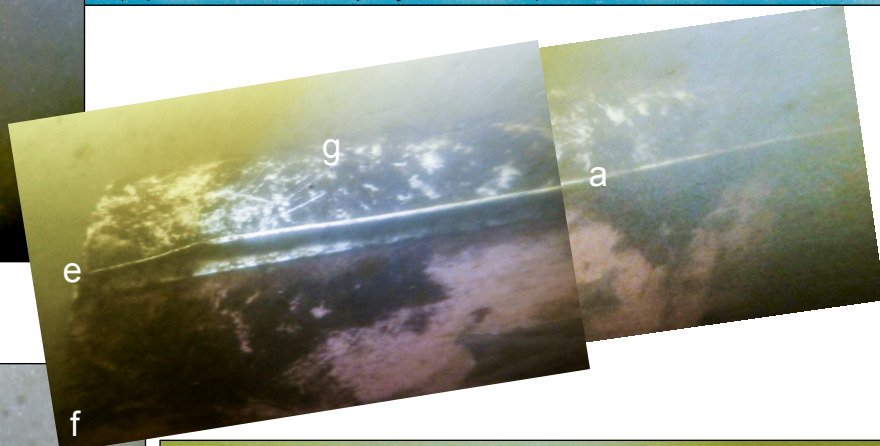
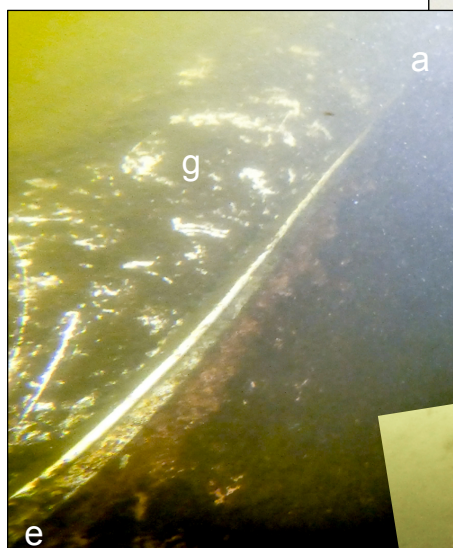
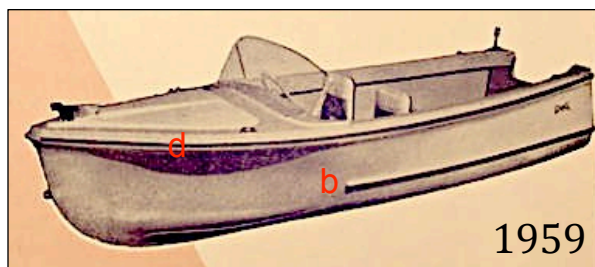


Whiz Ski Wreck, 21-DK-162 (Anomaly 12)

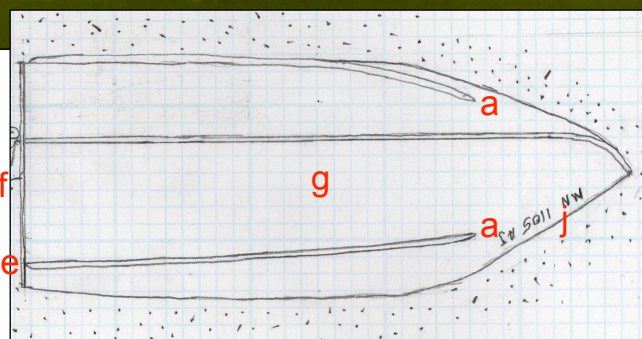
MHM recorded a sonar image of the *Whiz Ski Wreck* (Anomaly 12) during the Crystal Lake Sonar Survey as part of the Minnesota Suburban Lakes Projects on October 19, 2020. Underwater archaeological reconnaissance conducted to identify and document Anomaly 12 took place during the Southern and West Metro Lakes Underwater Archaeology Project. The *Whiz Ski Wreck* is a Minnesota-built 1958 Pipestone Sales Company De Luxe Princess model. Anomaly 12's fiberglass hull is white and red (faded to pink) on the sides and deck with a white bottom. Factory determined length for this boat model in 1958 are 14.75 feet long at the gunwale with an 'over-all' length of 13.83 feet. The gunwale measurement is greater than the over-all number because the gunwale is curved, while the over-all measurement is taken straight down the centerline of the boat from bow to stern. These numbers are helpful in documenting this wreck because she is capsized with her starboard side imbedded into the lake bottom, making exact measurements impossible. But, with the starboard side down in the silt, the port side is suspended in the water column enough to access the interior of the wreck. The front bench with 2 seat backs and the stern bench are intact, and the raised fiberglass rectangular keelson is clearly visible on the inner hull bottom. Low visibility prevented a complete digital recording of the attributes inside the hull, but the wreck does have a steering wheel and dash dials. What is seen - related to dash controls - is the pitot tube-type speedometer attached to the bottom of the transom; its cable runs 'up' the transom toward the stern gunwale where it enters the hull, leading to the speedometer in the dash. A bit of the foredeck was seen, along with a large white horn attached on the port side. The deck likely has a lifting handle, navigation light, cleats, and possibly a pennant

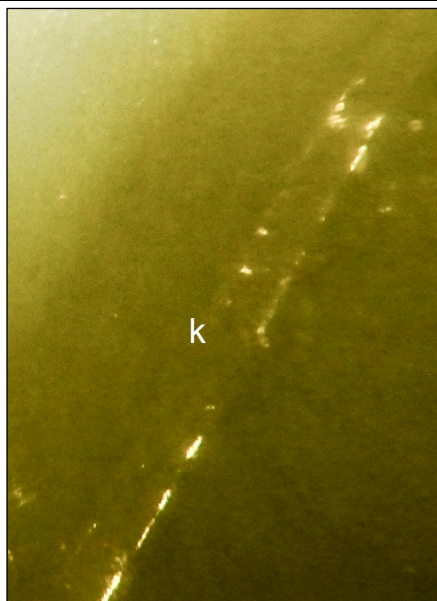
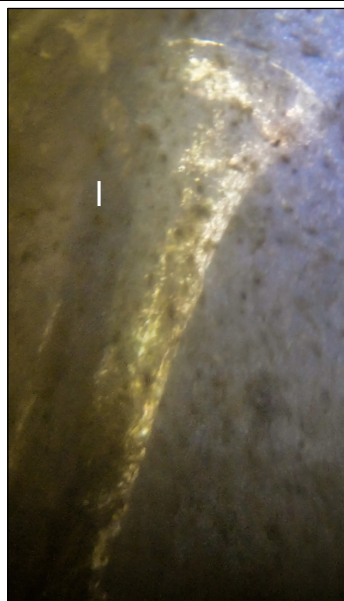
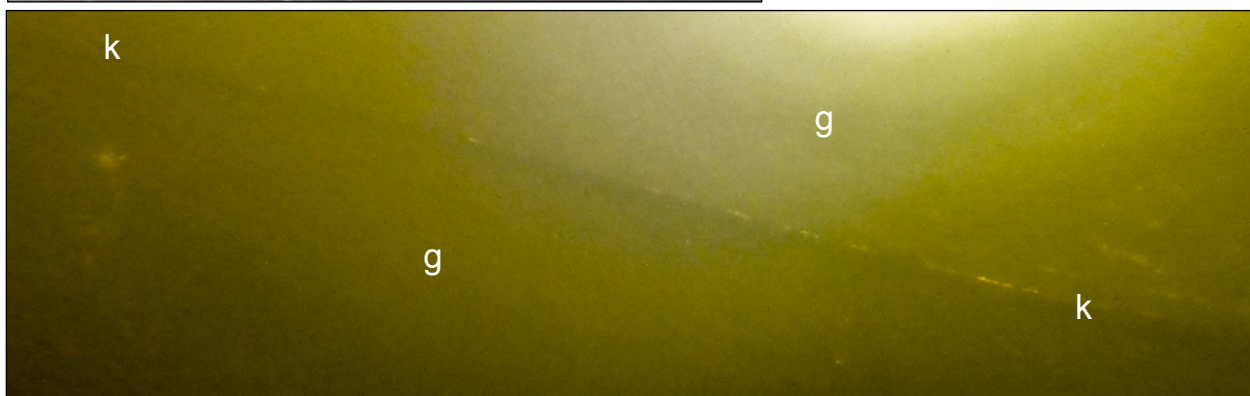
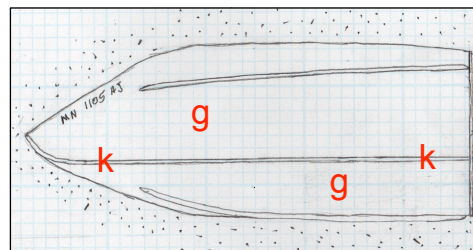
holder, but they cannot be seen. The wreck has a 'deployed' bimini top frame (one of the options that makes this model a De Luxe Princess), and a line is leading off the port stern; this rope might be a ski pull or a mooring line. The exposed bottom of the wreck has an extruded aluminum keel along the centerline that blends into the fiberglass stempost, and 2 substantial and diagnostic splashrails can be seen on both port and starboard. The first year Pipestone Sales produced runabout fiberglass boats was 1955, and in the few years that followed, the Princess model underwent design changes that are indicators of age. In 1957, the Princess had a mahogany transom 'married' to the fiberglass at both the port and stern quarters, a long aluminum splashrail, and a wooden rubrail. In 1958, the Princess splashrails are long and aluminum, and this model also had aluminum rubrails attached with Phillips head screws. In 1958, the aluminum splashrails are shorter than in the previous 2 years, the rubrail is aluminum, and the front seats are on swivels; in all previous versions of this model, the seats are affixed to a bench and face forward only. Additionally in 1958, a special edition Princess was produced and promoted at Boat Shows - the Royal Princess - whose molded hull does not resemble any Princess model before or after it was offered. Lastly, beginning in 1960, the Pipestone Princess's bottom has a faux lapstrake design and construction, a big change in the fiberglass mold used for this production. The *Whiz Ski* Wreck carries a white and gold 1958 Johnson Super Sea Horse 50 HP outboard motor, a substantial and heavy engine. MHM knows that the wreck's name is *Whiz Ski* because it is clearly spelled-out on the hull's port side quarter; it may be on the starboard side as well, but it was not uncovered during this work. MHM knows that the wreck is a Pipestone Princess Deluxe model because of the Pipestone logo that survives on the port quarter, the size of the wreck (specific to the Princess model), and the presence of the large bimini top that is one of the add-ons available in the Deluxe option. Lastly, Anomaly 12's registration number is clearly seen on the port bow and it is MN 1105 AJ. This number as given to the boat in 1959, based on the AJ assignment. A black and white Minnesota-shaped validation sticker dated to 1967-1968 tells MHM that the boat sank before the end of 1968. However, the DNR records associated with this registration number indicate that a 1971 14-foot Crestliner that was licensed through December 1988, carried this number after *Whiz Ski* sank (Kong Moua, Personal Communication, 27 June 2022). Whomever owned Anomaly 12 transferred her number to their new boat after she sank; this is not supposed to occur. However, MHM has identified several wrecks on the bottom of Minnesota's lakes whose registration numbers have 'lived on' after they have landed on the bottom. MHM submitted a Minnesota Archaeological Site Form to the OSA and Anomaly 12 received her site number - 21-DK-162 - at that time. 21-DK-162 is protected under the Federal Abandoned Shipwreck Act of 1987 and 1954 Minnesota State Law.



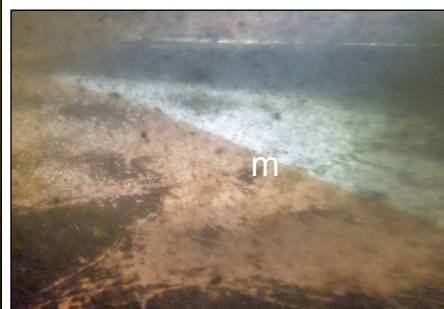


- a: Long Aluminum Splashrail
- b: Short Aluminum Splashrail
- c: Wooden Rubrail
- d: Aluminum Rubrail
- e: Long Aluminum Splashrail Port Quarter
- f: Stern
- g: Hull Bottom
- h: Transom
- i: Pitot Tube-Type Speedometer
- j: Starboard Bow Registration Number

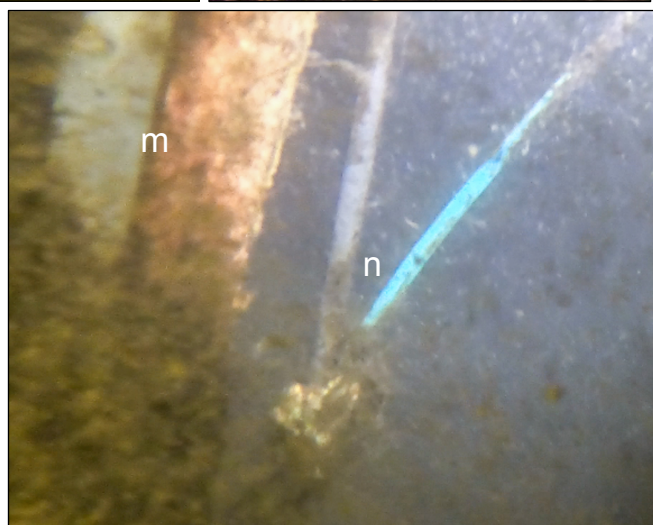
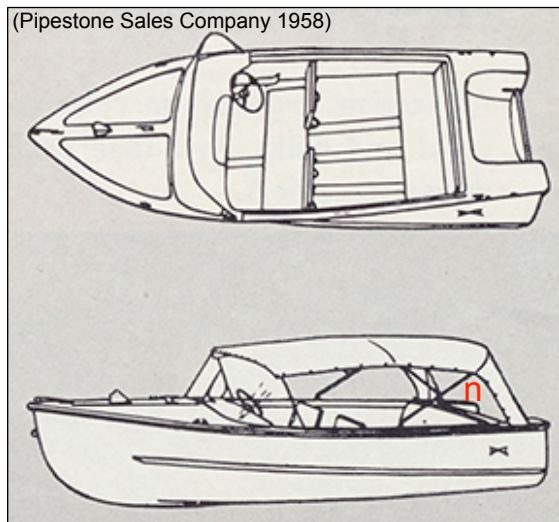




d: Aluminum Rubrail
 g: Hull Bottom
 k: Extruded Aluminum Keel
 l: Horn on Foredeck
 m: Two-Tone Hull Color
 n: Bimini Frame

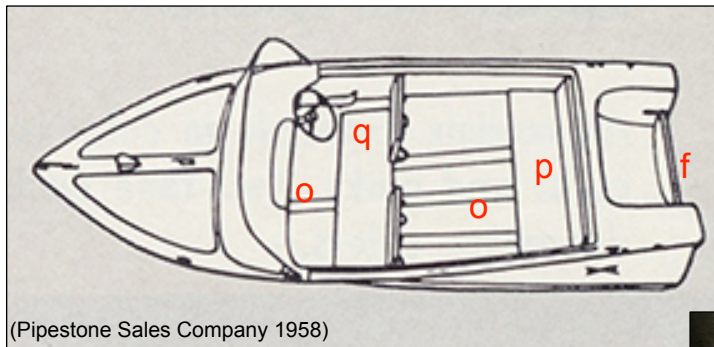
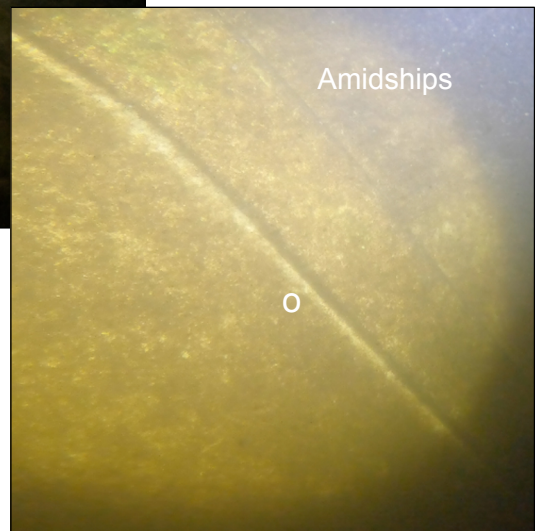


(Pipestone Sales Company 1958)

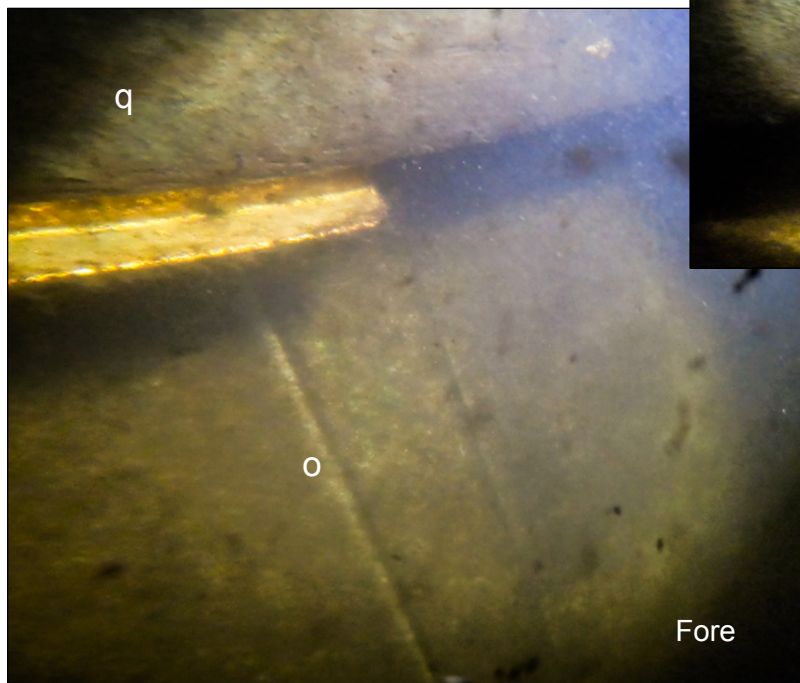


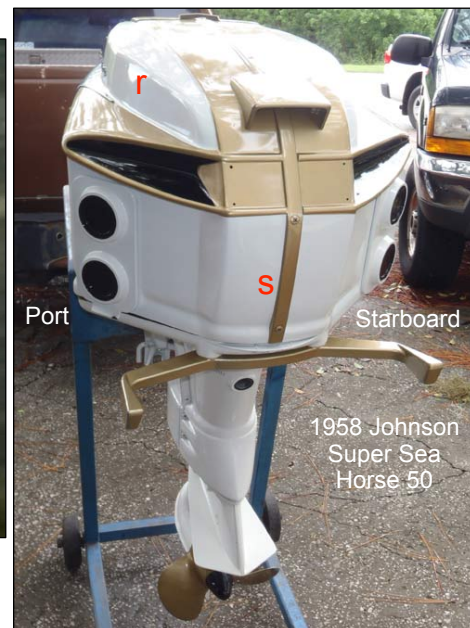


o: Keelson
p: Rear Bench
q: Forward Bench

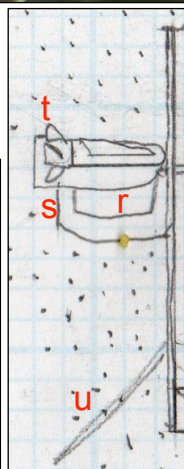


(Pipestone Sales Company 1958)



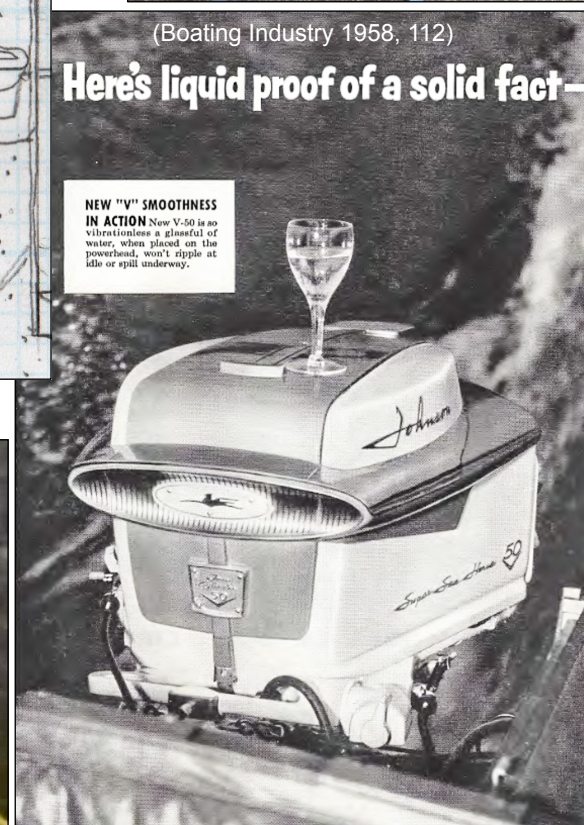


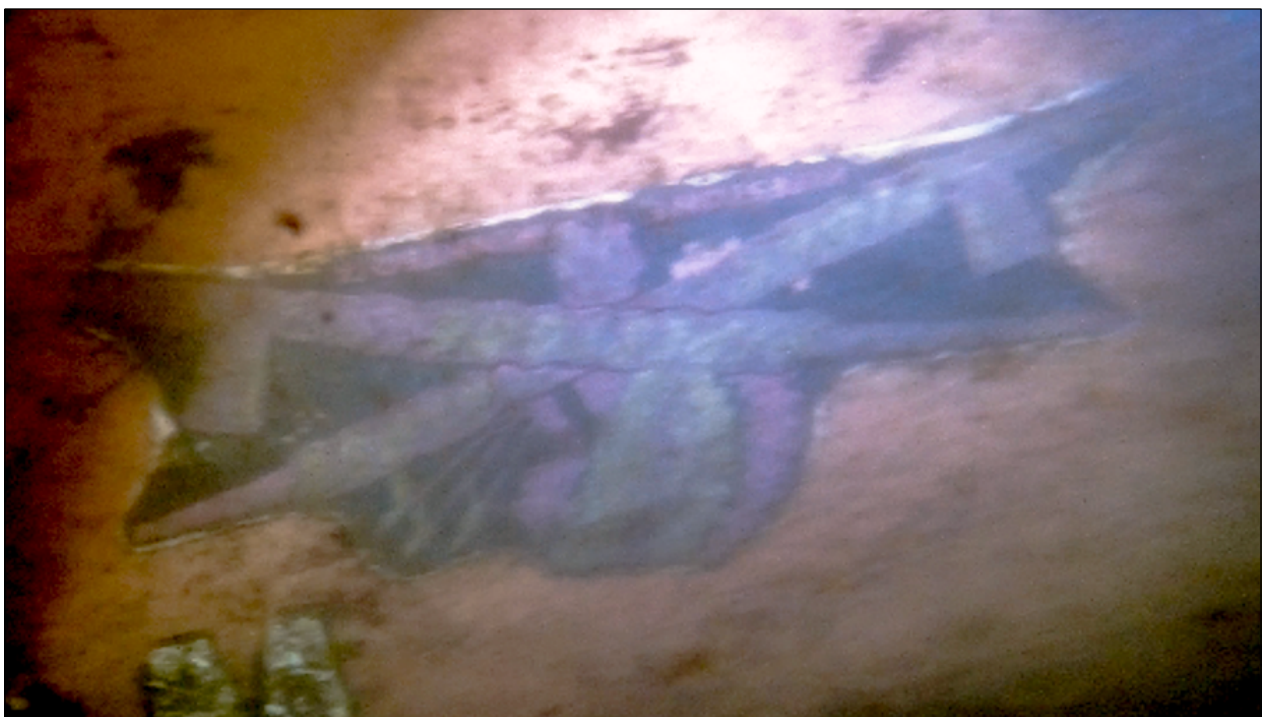
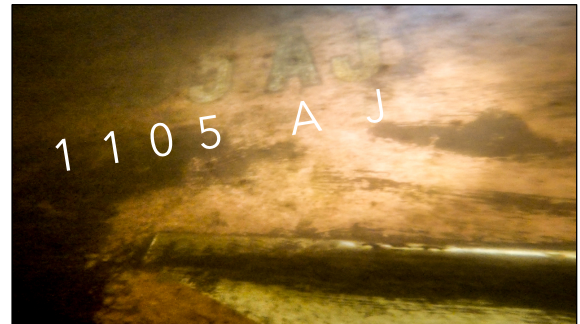
r: Powerhead
s: Rear Powerhead
t: Propellor
u: Line Off Stern



(Boating Industry 1958, 112)
Here's liquid proof of a solid fact—

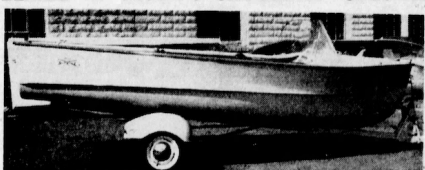
**NEW "V" SMOOTHNESS
IN ACTION** New V-50 is so
vibrationless a glassful of
water, when placed on the
powerhead, won't ripple at
idle or spill underway.







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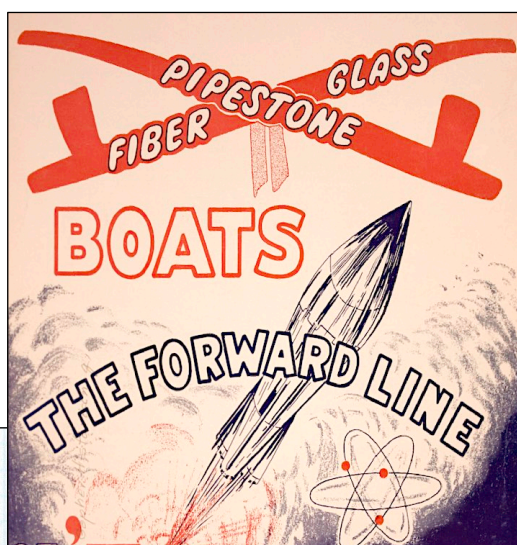
Elmer N. Olson Co.

EST. 1922
CONVENIENT DOWNTOWN LOCATION
500 SO. 11th ST.
OPEN MONDAY AND THURSDAY EVENINGS
FE 2-8391

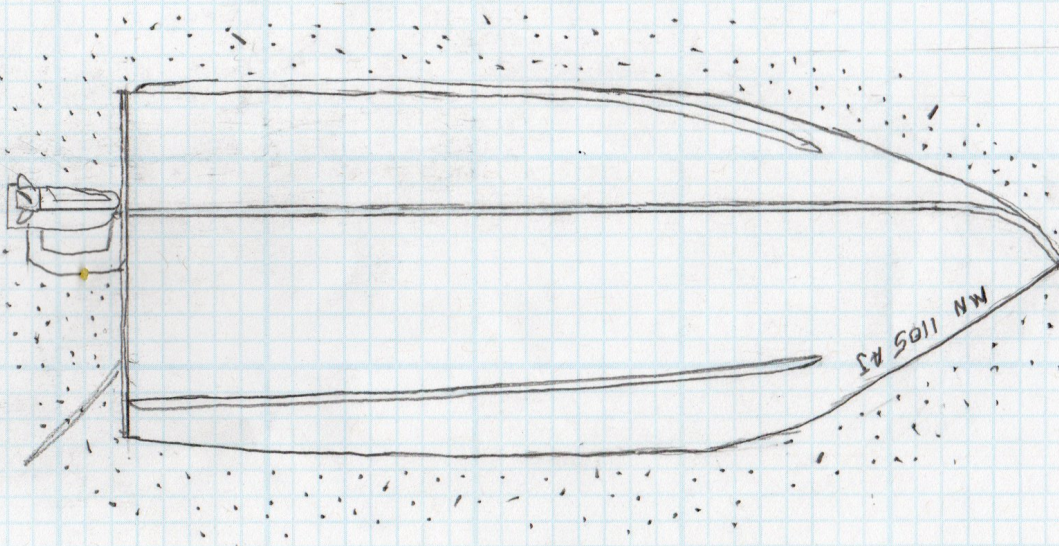
DON'T
WORRY
ABOUT
MONEY

Elmer N. Olson
has just the
Budget Terms that will
meet *your* individual
need.
LOWEST TERMS

(Minneapolis Morning Tribune 1958)



(Pipestone Sales Company 1959)



Site Sketch by MHM's Christopher Olson

3'

Starcraft Skylark Wreck (Anomaly 1)

On the day MHM located Anomaly 1, no video or still photographs were produced due to zero visibility conditions. By feel, the shape of the wreck was discerned and a rudimentary sketch made after the dive aided in her identification. She is a white Starcraft Boat Company Skylark fiberglass sailboat manufactured between 1964-1975 in Goshen, Indiana. The Skylark is 14.00 feet long and 55 inches in the beam, her cockpit is 7.00 feet long, her mast is 22.00 feet tall, and she carried 100 square feet of sail. Only the hull survives; the mast and sail are missing and are not evident as being nearby in sonar images. No registration could be discerned and a sinking date cannot be determined at this time (Starcraft Boat Division 1964). Anomaly 1 is an underwater resource under the protection of the Federal Abandoned Shipwreck Act of 1987 and 1954 Minnesota State Law.



(Starcraft Boat Division 1964;
Starcraft Company 1970)



(Starcraft Boat Company 1965)

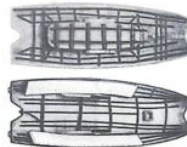


skylark

14 ft. fiberglass

Glide with the soft breeze! Relax and listen to the whisper of the waves as Skylark gently nudges through the water. This breeze-powered beauty with Captain's Blue deck and Corsair White hull has proven itself to be an instant success. Over 1,000 were sold the first year! A one-design racing class has been established with an annual regatta. Skylark is a great training boat for beginning sailors. Yet experts and old-timers find it exhilarating and challenging due to its sophisticated design. (U.S. Pat. No. D-199,340—additional patents pending.)

STANDARD EQUIPMENT INCLUDES: 100 sq. ft. Dacron self-adjusting sail, 22 ft. (bending spar) anodized aluminum mast, anodized aluminum boom, special corrosion-resistant polished aluminum hardware, pivoting aluminum lee boards, kick-up aluminum rudder, aluminum tiller, and unobstructed self-draining cockpit, tunnel-planing hull. Skylark is a Marconi cat rig sailboat.



Skylark has a unique tunnel-planing hull with tubular construction for strength and rigidity. Hull and deck are precisely matched. All points of stress are reinforced with marine plywood and fiberglass.

Skylark	
Center Length	14'2"
Beam	56"
Center Depth	17"
Cockpit Length	7'
Mast Height	22'
Approx. Weight	200 lbs.
Sail Area	100 sq. ft.
Recommended Capacity:	
Pounds	450
Persons	3

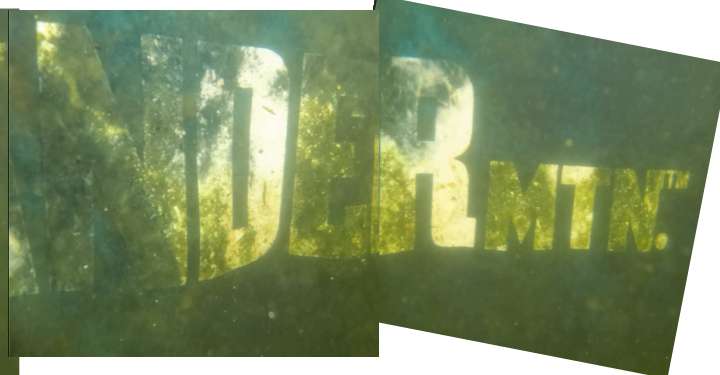
credits:

Brantly Helicopters
Russ Miller Distributors
The Coleman Company
Outing Products
Shakespeare Company
Fishing Rods and Reels
W. J. Volt Rubber Corporation
Scuba Diving Gear and Water Skis
Windbreaker-Danville Company
Men's Jackets
Photography by Ozzie Sweet



Gander Mountain Clam 6800 Fishing Shanty, Anomaly 25

Initially, the appearance of Anomaly 25's sonar signature suggested it was a vehicle or some other large object. MHM has identified fish house remnants in other lakes (White Bear Lake, Prior Lake), but their sonar images were suggestive of the traditional Minnesota rectangular plywood fish house. Anomaly 25 is a Gander Mountain Clam 6800 Fish Shanty constructed of synthetic blue and white fabric with an aluminum frame and plastic sled-like bottom. The Clam 6800 measures 8.00 feet long by 6.00 feet wide by 6.30 feet tall; Anomaly 25 is lying on its side. The Clam 6800 is portable, folding up like a suitcase for transport, and can accommodate 6 people for fishing through 6 pre-cut holes in the floor that have removable covers. There is a bit of knotted rope attached to the shanty, along with a maroon and gold fishing lure. A manufacturing date for the Clam 6800 lies roughly between 2003-2008 based on the style of the Gander Mountain logo (2003-2017) and the last located ad for this shanty style (*Green Bay Post-Gazette* 2008) The sinking date for Anomaly 25 can only be pin-pointed to between 2003 and ice-out of 2020. The Gander Mountain Clam 6800 Fishing Shanty is a Minnesota State protected underwater cultural resource.



Unidentified Wreck, Anomaly 2

Anomaly 2 is a wreck, but in zero visibility conditions, it was not located. MHM will resume the search for this wreck in the near future.



Conclusion

MHM identified the first 4 wrecks on the bottom of Crystal Lake - and in Dakota County - during the CLUA Project - the Wooden Flat-Bottomed Wreck (21-DK-161), Steel Wineglass Stern Wreck (21-DK-160), *Whiz Ski* Wreck (21-DK-162), and the Starcraft Skylark Wreck (Anomaly 1). The newly recognized wrecks offer significant and interesting data into the maritime history of the Crystal Lake area in terms of small unpowered, wood, steel, and fiberglass watercraft use by southern metro Minnesotans. As stated previously, the Wooden Flat-Bottomed Wreck (21-DK-161) is similar to 12 other wrecks MHM has identified in 7 other lakes within the 7 county metro area¹. The knowledge gained from documenting these other similar wrecks - along with 2 non-wreck examples similar to this watercraft type held by museums² - greatly assisted MHM with investigating 21-DK-161 in low visibility conditions. Understanding and explaining these small wooden watercraft wrecks assists in establishing how early 20th Century Minnesotans used these boats for recreation, travel, and food procurement. Additionally, they represent the local booming boat-building industry that in a real way supported Minnesota's economy and provided craftsmen with a livelihood.

A rather rare survivor, the 21-DK-160 is only 1 of 3 steel wrecks of this design identified to date in Minnesota's archaeological record; she is also the worst preserved of this small group. Her port and starboard sides are greatly deteriorated, and her bow is essentially missing. However, her diagnostic wineglass stern is intact and fortunately, not covered with rocks or silt, allowing for the recording of the transom's attributes. Like 21-DK-161, this well-designed watercraft represents the small boat-building industry in Minnesota, albeit a very different one compared to the Wooden Flat-Bottomed Wreck. These types of small steel boats emulated wooden wineglass stern designs, but their

¹MHM has identified 4 Fisherman's Friend Wrecks in Lake Minnetonka (21-HE-485, 21-HE-489, 21-HE-499, 21-HE-509) and 2 museum examples have been documented using 3D technology (West Hennepin History Center, Museum of Lake Minnetonka). Additionally, MHM has identified 8 small wooden flat-bottomed wrecks in Lake Minnetonka (21-HE-488), Christmas Lake (21-HE-543), Medicine Lake (21-HE-518), Lake Johanna (21-RA-85), Lake Pulaski (21-WR-203), Forest Lake (21-HE-123), and Prior Lake (21-SC-116 and Anomaly 84 from this project).

²One 'non-wreck' Fisherman's Friend boat held by the Museum of Lake Minnetonka was once a wreck, illegally raised by a diver. In 2003, MHM's staff underwater archaeologists facilitated her acceptance into the MLM collection with the permission of the OSA. MHM also 3D scanned this boat; see Merriman and Olson 2019.

fabrication required a completely different set of skills by the boatwrights that constructed them. The existence of the 'Minnetonka Steel Boat' by the Minneapolis Steel Boat Company indicates a focus on the suburban Twin Cities market in terms of small metal boat construction; someone on Crystal Lake responded to this local supply. The *Whiz Ski Wreck*, a 1958 Pipestone Sales Company De Luxe Princess model, represents post-war prosperity and the proliferation of boat-owning by millions of people once not able to afford such a 'luxury'. Further, she is the first identified Pipestone wreck in Minnesota. Throughout the 1950s and into the early 1960s, fiberglass boat-building companies were established all over the United States after fiberglass technology was acquired by enterprising business owners; many firms folded within a few years. Founded in the mid-1950s, Pipestone Sales Company was not one of these companies. MHM cannot determine - at this time - why 21-DK-162 sank, but her name might be suggestive of a reason. The second fiberglass wreck in Crystal Lake, the *Starcraft Skylark Wreck*, is representative of unpowered pleasure boating and possibly small craft racing. It is unknown at this time why the boat sank; poor visibility did not allow for video or detailed measured drawings of the wreck. The *Gander Mountain Clam 6800 Fishing Shanty* (Anomaly 25) joins identified fish houses in *Prior Lake* (Anomaly 30) and *White Bear Lake* (Anomaly 14). MHM is positive that dozens or more fish houses lie on the bottom of Minnesota's thousands of lakes, but only 3 have been confirmed to date. Unlike the other houses, Anomaly 25 in Crystal Lake has nylon walls, a plastic bottom, and is portable/collapsible.

As a whole, the SWMLUA Project produced interesting and significant results investigating 24 anomalies in 4 lakes in 3 counties using SCUBA. MHM dove upon and identified 11 wrecks, 2 maritime sites, and 4 'other' objects in Crystal Lake, Lake Minnewashta, Lotus Lake, and Prior Lake. Of the 11 wrecks, MHM acquired Minnesota Archaeological Site Numbers for 7 of them: 3 in Lotus Lake, 1 in Prior Lake, and 3 in Crystal Lake. The documentation of these sites and similar wrecks in the future will provide historians and scholars with opportunities to further study, explain, and analyze these protected submerged cultural resources. The wrecking processes responsible for the creation of Minnesota's submerged cultural resources have produced a variety of underwater sites. Identifying, comparing, and associating these new sites in Crystal Lake, Lake Minnewashta, Lotus Lake, and Prior Lake, along with known sites increases our understanding of the historical context within which these cultural resources operated or were exploited by Minnesotans. Future studies will greatly enhance our shared maritime history through the recognition of submerged cultural resources and the stories behind their construction and disposition. The diversity of nautical, maritime, and underwater sites so far identified by MHM in Minnesota's lakes are tangible examples of the rich maritime history of the area.

MHM continues to re-examine recorded sonar footage from completed remote sensing surveys. Targeted re-scanning has occurred in several lakes using knowledge gained from the comparison of anomalies that have proven to be wrecks or other submerged cultural resources in past projects. With improved technology, future scanning projects will produce clearer data. The results of the SWMLUA Project summarized above is connected to all the work that came before and will come after its completion. At this point, watercraft located in Minnesota's suburban lakes represent approximately 1,000 years of Minnesota's maritime history and nautical archaeology. In the historic period,

the known wrecks represented in these lakes span around 150 years of local maritime culture. It is clear – even through this Phase 1 pre-disturbance nautical archaeological investigation – that the types of sites that exist in Minnesota’s suburban lakes documented to date are diverse, archaeologically and historically significant, and worthy of great attention. Through research, diving on wrecks and anomalies to collect pertinent data, and ensuring that the collected information is accessible by the public, MHM will continue to investigate Minnesota’s submerged cultural resources into the future.

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